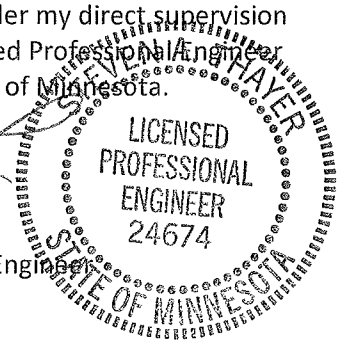
Geotechnical Evaluation Report

Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

Prepared for

City of Hutchinson

Professional Certification:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Steve A. Thayer, PE
Associate Principal/Senior Engineer
License Number: 24674
March 12, 2009

Project SC-09-00696

Braun Intertec Corporation

BRAUN
INTERTEC

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March 12, 2009

Project SC-09-00696

Mr. Keith Messner
City of Hutchinson
111 Hassan Street SE
Hutchinson, MN 55350-2522

Re: Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

Dear Mr. Messner:

We are pleased to present this Geotechnical Evaluation Report for the proposed industrial park. A summary of our results and recommendations is presented below. More detailed information and recommendations follow the Table of Contents.

Summary of Results

We completed 8 borings along the proposed roadway alignments. The borings generally encountered 1 to 1 1/2 feet of topsoil underlain by silty clay, silty clayey sand, clayey sand or silty sand. Lean clay was encountered below these soils, below about elevation 1055. Penetration resistances indicated the clay soils were generally medium to stiff. The silty sand was generally medium dense. Groundwater was observed only in Boring B-7, within a sand layer at a depth of 15 feet.

Summary of Recommendations

Based on the borings and proposed utility inverts, it appears the utility subgrades will generally consist of clayey sand, silty clay or lean clay. It is our opinion these soils will be suitable for support of the utilities. Sand bedding material should be imported to the site. Dewatering will likely not be required for installation of the utilities.

We recommend topsoil be completely removed from the proposed roadway alignments. Backfill and fill should then be placed and compacted to desired grades. We anticipate the roadway subgrades will consist of clayey soils. We recommend designing the roadways with an assumed R value 10.

Remarks

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please call Steve Thayer at 320.202.7225.

Sincerely,

BRAUN INTERTEC CORPORATION

Steve A. Thayer, PE
Associate Principal/Senior Engineer

Mark W. Gothard, PE
Principal Engineer

Geo Report

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Appendix

Boring Location Sketch
Log of Boring Sheets B-1 through B-8
Descriptive Terminology

A. Introduction

A.1. Project Description

The City of Hutchinson is planning to construct utilities and roadways for a new industrial park. The project is located on the north side of 5th Avenue, east of Industrial Boulevard in Hutchinson, Minnesota.

A.2. Purpose

The purpose of our borings was to provide subsurface soil and groundwater information to aid in designing the utilities and roadways and in preparing plans and specifications for construction.

A.3. Documents Provided

Mr. Keith Messner, City of Hutchinson, provided us with copies of the Utility Plan for Energy Park North Feasibility Report. The plans were prepared by SEH. Mr. Messner also provided us with a copy of the plat plan for the project. The plan also showed the boring locations.

A.4. Site Conditions

The site is an existing farm field that slopes generally downward to the east. The plat plan indicated there is a utility easement that runs generally east to west, across the southern part of the site.

A.5. Scope of Services

Tasks performed in accordance with our authorized scope of services included:

- Performing a reconnaissance of the site to evaluate equipment access to exploration locations.
- Coordinating the locating of underground utilities near the proposed boring locations.
- Performing 4 borings to a depth of 16 feet and 4 borings to a depth of 26 feet.
- Performing laboratory percent-passing-200-sieve tests on selected penetration test samples.

- Preparing this report containing a sketch, exploration logs, a summary of the geologic materials encountered, results of laboratory tests, and recommendations for structure subgrade preparation and the design of the utility installation and roadways.

Boring locations and surface elevations were staked and surveyed by the City of Hutchinson.

B. Results

B.1. Exploration Logs

B.1.a. Log of Boring Sheets

Log of Boring sheets for our penetration test borings are included in the Appendix. The logs identify and describe the geologic materials that were penetrated, and present the results of penetration resistance tests, laboratory tests performed on penetration test samples retrieved from them, and groundwater measurements.

Strata boundaries were inferred from changes in the penetration test samples and the auger cuttings. Because sampling was not performed continuously, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may also occur as gradual rather than abrupt transitions.

B.1.b. Geologic Origins

Geologic origins assigned to the materials shown on the logs and referenced within this report were based on visual classification of the penetration test samples, penetration resistance testing, laboratory test results, and available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

B.2. Geologic Profile

B.2.a. Geologic Materials

We completed 7 borings along the proposed street and utility alignments and 1 boring in the proposed pond area. The borings generally encountered 1 to 1 1/2 feet of topsoil underlain by clayey sand, silty clay and silty sand. Lean clay was encountered below these soils, generally below elevation 1055.

Penetration resistances in the silty sand soils generally ranged from 16 to 42 blows per foot (BPF), indicating they ranged from medium dense to dense. Penetration resistances in the clayey soils ranged from 7 to 27 BPF, indicating they ranged from medium to very stiff.

B.2.b. Groundwater

Groundwater was observed only in Boring B-7, at a depth of 15 feet. The groundwater was observed within a layer of sand. Based on the moisture contents of the geologic materials encountered, it appears that the static groundwater was below the depths explored.

Seasonal and annual fluctuations of groundwater, however, should be anticipated.

B.3. Laboratory Test Results

We selected penetration test samples and determined the percent material by weight passing the 200 sieve for the samples. The samples we tested had 37 to 67 percent, and were classified as clayey sands and silty clays. The test results are also provided in the "Tests or Notes" column on the Log of Boring sheets, adjacent the sample tested.

C. Basis for Recommendations

C.1. Design Details

C.1.a. Proposed Construction

The project will consist of extending Industrial Boulevard to the east and constructing a new alignment of Energy Park Drive to the north and east through the site. Watermain, sanitary sewer and storm sewer utilities will also be installed. The watermain will be installed with 8 feet of cover, the sanitary sewer will have invert depths ranging from 15 to 30 feet. Storm sewer depths will generally ranged from 3 to 6 feet. Storm water ponds will also be constructed on the site, with depths of approximately 6 feet.

C.1.b. Precautions Regarding Changed Information

We have attempted to describe our understanding of the proposed construction to the extent it was reported to us by others. Depending on the extent of available information, assumptions may have been made based on our experience with similar projects. If we have not correctly recorded or interpreted the

project details, we should be notified. New or changed information could require additional evaluation, analyses and/or recommendations.

C.2. Design and Construction Considerations

The geotechnical issues influencing design and construction of the utilities for the project appear to be limited. The geologic materials present at anticipated invert elevations generally appear suitable for support of the proposed utilities. The soils, however, should be considered corrosive.

For roadway construction, the soils are marginal subgrade soils and will require thick pavement sections and drainage.

The subgrade soils should be considered frost-susceptible. Mn/DOT design standards (mn/DOT Technical Memorandum 04-06-MAT-01 dated March 1, 2004) recommend minimum thicknesses of frost-free materials (FFMs) over frost-susceptible subgrade soils. When the anticipated traffic is equal to or less then one million 18-kip equivalent single-axle loads (ESALs), a minimum of 6 inches of FFM (Class 5 or Select Granular Borrow) should be placed between a minimum of 3 inches of Class 5 aggregate base and the frost-susceptible subgrade soils.

The subgrade soils are relatively impermeable. Water that gets into the aggregate base course and granular subgrade backfill may collect in the base course and granular backfill and saturate them if drainage is not provided. We recommend drains be placed at the low points of the alignment to provide drainage for the base course and granular subgrade backfill.

D. Recommendations

D.1. Pavement Subgrade Preparation

D.1.a. Excavations

We recommend removing the topsoil from within 3 feet of the bottom of the aggregate base for the proposed roadways. After stripping, we recommend that the upper 1/2 foot of the underlying soil subgrade be scarified, moisture conditioned to a moisture content near optimum, and compacted to a minimum of 95 percent of its standard Proctor maximum dry density. If there are areas that cannot be

compacted or are very soft, we recommend the unstable of soft materials be removed and replaced by compactable backfill.

To provide lateral support for the replacement backfill, additional required fill and curbs and gutters, we recommend oversizing (widening) the excavations 1 foot horizontally beyond the backs of the proposed curbs for each foot the excavations extend below the tops of the curbs.

D.1.b. Selecting Excavation Backfill and Additional Required Fill

We recommend the initial lift of backfill over wet excavation bottoms consist of at least 2 feet of relatively coarse sand having less than 50 percent of its particles by weight passing a 40 sieve, and less than 5 percent of its particles passing a 200 sieve. We anticipate that this material will need to be imported.

Additional backfill and fill may consist of sand, silty sand, clayey sand, sandy lean clay or lean clay. We recommend, however, that the plastic index of these materials not exceed 25.

D.1.c. Placement and Compaction of Backfill and Fill

We recommend spreading backfill and fill in loose lifts of approximately 12 inches. We recommend compacting backfill and fill to a minimum of 95 percent of it standard Proctor maximum dry density as determined in accordance with ASTM International Test Method D 698. In the upper 3 feet of subgrades, we recommend 100 percent.

D.1.d. Subgrade Proof-Roll

Prior to placing aggregate base material, we recommend proof-rolling pavement subgrades to determine if the subgrade materials are loose, soft or weak, and in need of further stabilization, compaction or subexcavation and recompaction or replacement. A second proof-roll should be performed after the aggregate base material is in place, and prior to placing bituminous or concrete pavement.

D.1.e. R value

Laboratory tests to determine an R-value for pavement design were not included in the scope of this project. Based on a clay subgrade, we recommend assuming an R value of 10 for design.

D.1.f. Materials and Compaction

We recommend specifying crushed aggregate base meeting the requirements of Minnesota Department of Transportation (Mn/DOT) Specification 3138 for Class 6. We recommend that the bituminous wear and base courses meet the requirements of Specifications 2360.

We recommend that the aggregate base be compacted to a minimum of 100 percent of its maximum standard Proctor dry density. We recommend that the bituminous pavement be compacted to at least 92 percent of the maximum theoretical density.

D.1.g. Subgrade Drainage

We recommend installing perforated drainpipes at low points of the alignment and around catch basins. The drainpipes should be placed in small trenches extended at least 8 inches below the aggregate base material.

D.2. Utilities

D.2.a. Subgrade Stabilization

Based on the invert elevations, it appears the subgrades for the utilities will be clay soils suitable for support of the bedding material and pipe.

D.2.b. Dewatering

Dewatering will likely not be required for installation of the utilities. Any water that may be trapped within sand layers can likely be controlled with sumps and pumps in the bottom of the excavations.

D.2.c. Selection, Placement and Compaction of Backfill

The utilities should be bedded with imported sand. We recommend selecting, placing and compacting utility backfill in accordance with the recommendations provided above in Section D.1.

D.3. Construction Quality Control

D.3.a. Excavation Observations

We recommend having a geotechnical engineer observe all excavations related to subgrade preparation and pavement construction. The purpose of the observations is to evaluate the competence of the geologic materials exposed in the excavations, and the adequacy of required excavation oversizing.

D.3.b. Materials Testing

We recommend density tests be taken in excavation backfill and additional required fill placed below pavements. We recommend Marshall tests on bituminous mixes to evaluate strength and air voids, and density tests to evaluate compaction.

We also recommend slump, air content and strength tests of Portland cement concrete.

D.3.c. Pavement Subgrade Proof-Roll

We recommend that proof-rolling of the pavement subgrades be observed by a geotechnical engineer to determine if the results of the procedure meet project specifications, or delineate the extent of additional pavement subgrade preparation work.

D.3.d. Cold Weather Precautions

If site grading and construction is anticipated during cold weather, all snow and ice should be removed from cut and fill areas prior to additional grading. No fill should be placed on frozen subgrades. No frozen soils should be used as fill.

Concrete delivered to the site should meet the temperature requirements of ASTM C 94. Concrete should not be placed on frozen subgrades. Concrete should be protected from freezing until the necessary strength is attained.

E. Procedures

E.1. Penetration Test Borings

The penetration test borings were drilled with a truck-mounted core and auger drill equipped with hollow-stem auger. The borings were performed in accordance with ASTM D 1586. Penetration test samples were taken at 2 1/2- or 5-foot intervals. Actual sample intervals and corresponding depths are shown on the boring logs.

E.2. Material Classification and Testing

E.2.a. Visual and Manual Classification

The geologic materials encountered were visually and manually classified in accordance with ASTM Test Method D 2488. A chart explaining the classification system is attached. Samples were sealed in jars or bags and returned to our facility for review and storage.

E.2.b. Laboratory Testing

The results of the laboratory tests performed on geologic material samples are noted on or follow the appropriate attached exploration logs. The tests were performed in accordance with ASTM or AASHTO procedures.

E.3. Groundwater Measurements

The drillers checked for groundwater as the penetration test borings were advanced, and again after auger withdrawal. The boreholes were then backfilled as noted on the boring logs.

F. Qualifications

F.1. Variations in Subsurface Conditions

F.1.a. Material Strata

Our evaluation, analyses and recommendations were developed from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth, and therefore strata boundaries and thicknesses must be inferred to some extent. Strata boundaries may also be gradual transitions, and can be expected to vary in depth, elevation and thickness away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until additional exploration work is completed, or construction commences. If any such variations are revealed, our recommendations should be re-evaluated. Such variations could increase construction costs, and a contingency should be provided to accommodate them.

F.1.b. Groundwater Levels

Groundwater measurements were made under the conditions reported herein and shown on the exploration logs, and interpreted in the text of this report. It should be noted that the observation period was relatively short, and groundwater can be expected to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

F.2. Continuity of Professional Responsibility

F.2.a. Plan Review

This report is based on a limited amount of information, and a number of assumptions were necessary to help us develop our recommendations. It is recommended that our firm review the geotechnical aspects of the designs and specifications, and evaluate whether the design is as expected, if any design changes have affected the validity of our recommendations, and if our recommendations have been correctly interpreted and implemented in the designs and specifications.

F.2.b. Construction Observations and Testing

It is recommended that we be retained to perform observations and tests during construction. This will allow correlation of the subsurface conditions encountered during construction with those encountered by the borings, and provide continuity of professional responsibility.

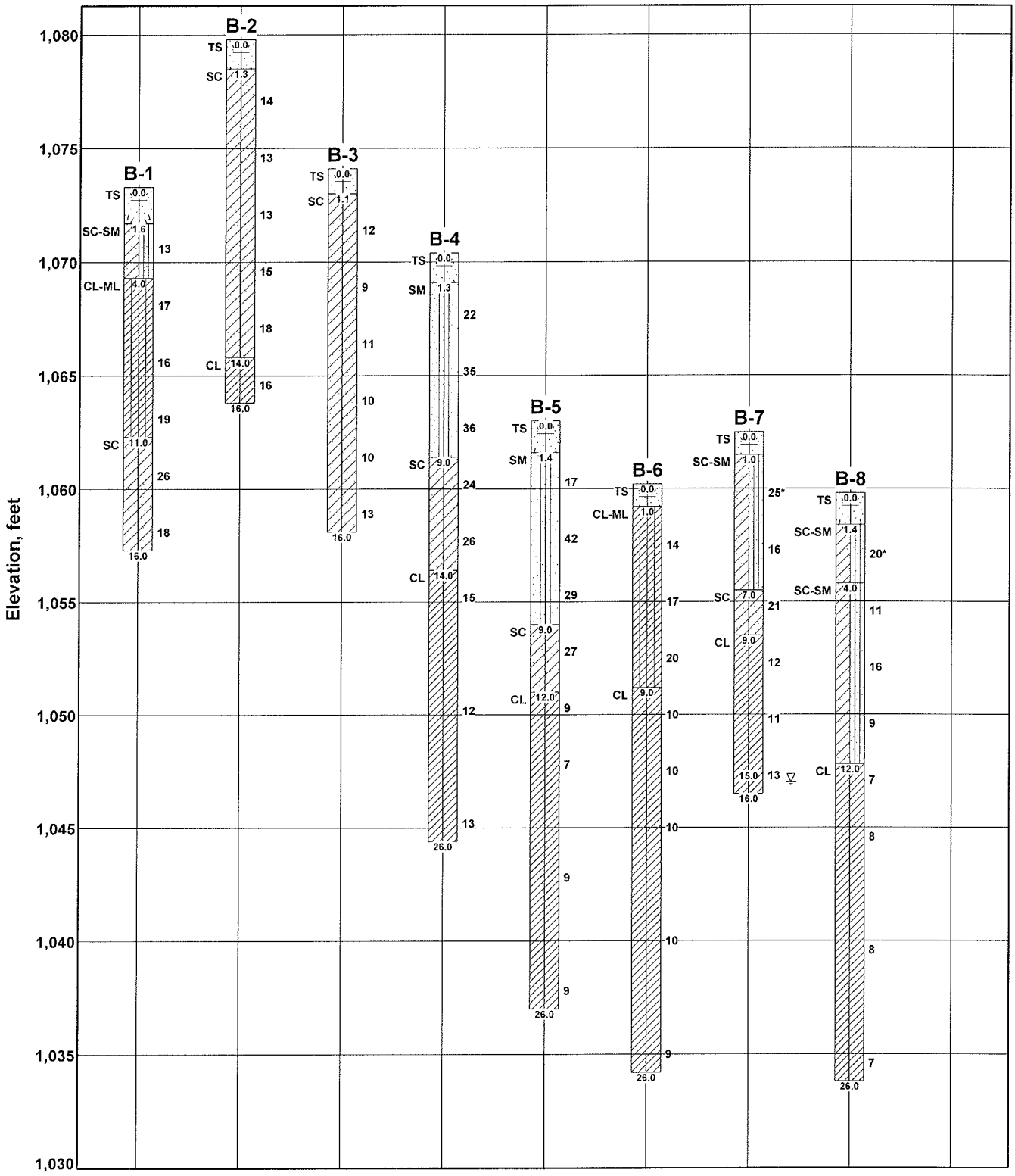
F.3. Use of Report

This report is for the exclusive use of the City of Hutchinson. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

F.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix



Fence Diagram: Point to Point

(Horizontal distance not to scale)

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

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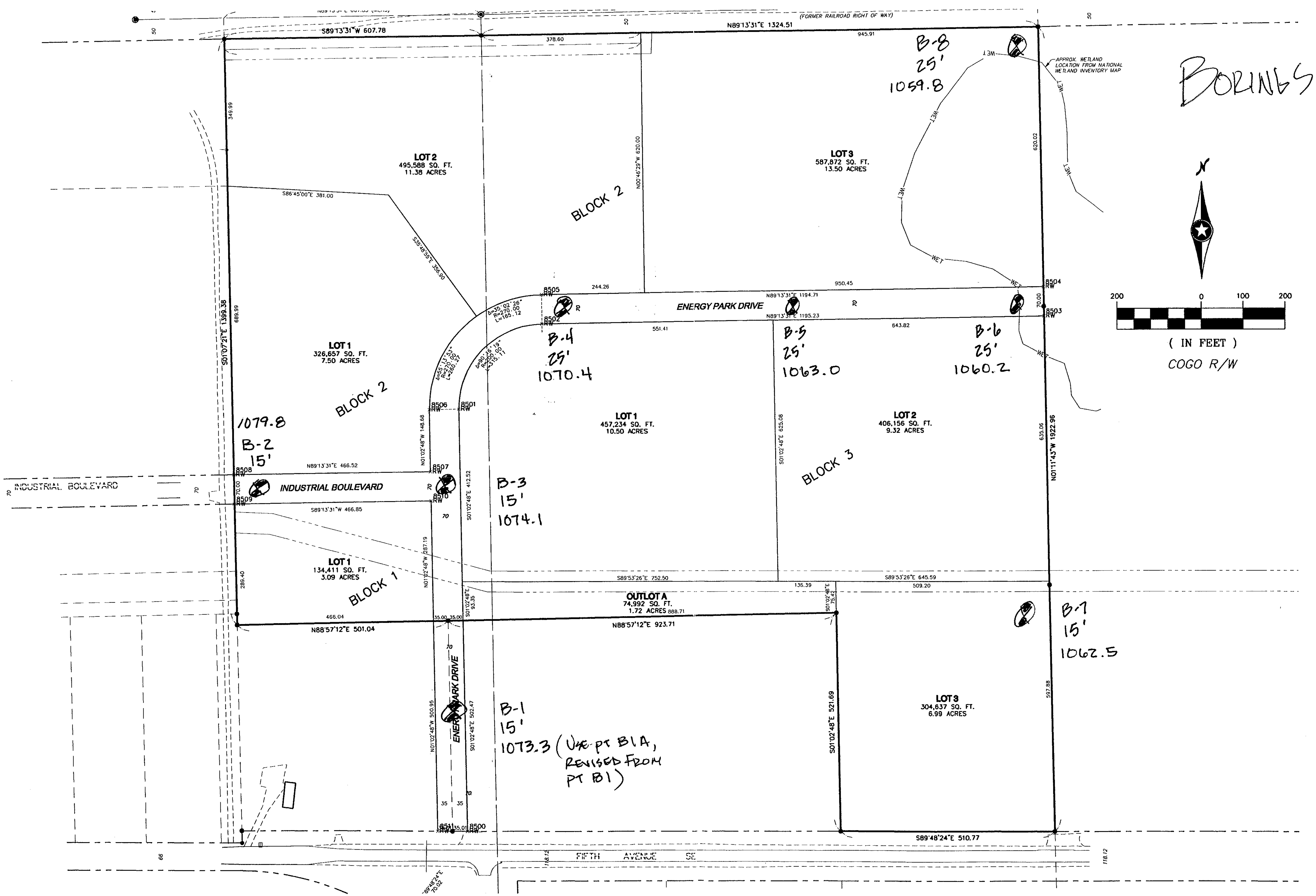
ELEVATION SCALE 00696.GPJ BRAUN_08.GDT 3/10/09 15:58


BORINGS
N
200 0 100 200
(IN FEET)
COGO R/W
(FORMER RAILROAD RIGHT OF WAY)
S89°13'31"W 607.78
N89°13'31"E 1324.51
APPROX. WETLAND LOCATION FROM NATIONAL WETLAND INVENTORY MAP
LOT 2
495,588 SQ. FT.
11.38 ACRES
BLOCK 2
LOT 3
587,872 SQ. FT.
13.50 ACRES
B-8
25'
1059.8
ENERGY PARK DRIVE
LOT 1
326,657 SQ. FT.
7.50 ACRES
BLOCK 2
B-4
25'
1070.4
B-5
25'
1063.0
B-6
25'
1060.2
LOT 1
457,234 SQ. FT.
10.50 ACRES
LOT 2
406,156 SQ. FT.
9.32 ACRES
BLOCK 3
1079.8
B-2
15'
INDUSTRIAL BOULEVARD
B-3
15'
1074.1
LOT 1
134,411 SQ. FT.
3.09 ACRES
BLOCK 1
OUTLOT A
74,992 SQ. FT.
1.72 ACRES
B-7
15'
1062.5
ENERGY PARK DRIVE
B-1
15'
1073.3 (Use pt B1A, Revised from pt B1)
LOT 3
304,637 SQ. FT.
6.99 ACRES
S89°48'24"E 510.77
FIFTH AVENUE SE

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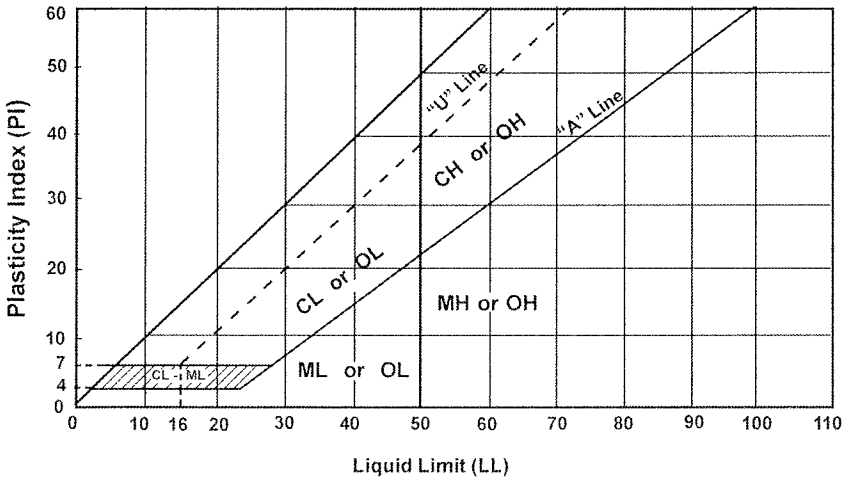
Descriptive Terminology of Soil

Standard D 2487 - 00
Classification of Soils for Engineering Purposes
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [a]				Soils Classification	
				Group Symbol	Group Name [b]
Coarse-grained Soils more than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels 5% or less fines [e]	$C_u \geq 4$ and $1 \leq C_c \leq 3$ [c]	GW	Well-graded gravel [d]
			$C_u < 4$ and/or $1 > C_c > 3$ [c]	GP	Poorly graded gravel [d]
		Gravels with Fines More than 12% fines [e]	Fines classify as ML or MH	GM	Silty gravel [d f g]
			Fines classify as CL or CH	GC	Clayey gravel [d f g]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands 5% or less fines [i]	$C_u \geq 6$ and $1 \leq C_c \leq 3$ [c]	SW	Well-graded sand [h]
			$C_u < 6$ and/or $1 > C_c > 3$ [c]	SP	Poorly graded sand [h]
		Sands with Fines More than 12% [i]	Fines classify as ML or MH	SM	Silty sand [f g h]
			Fines classify as CL or CH	SC	Clayey sand [f g h]
Fine-grained Soils 50% or more passed the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line [j]	CL	Lean clay [k l m]
			PI < 4 or plots below "A" line [j]	ML	Silt [k l m]
		Organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OL	Organic clay [k l m n]
				OL	Organic silt [k l m o]
	Silts and clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line	CH	Fat clay [k l m]
			PI plots below "A" line	MH	Elastic silt [k l m]
		Organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OH	Organic clay [k l m p]
				OH	Organic silt [k l m q]
Highly Organic Soils		Primarily organic matter, dark in color and organic odor		PT	Peat

a Based on the material passing the 3-in (75mm) sieve.
b. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name.
c. $C_u = D_{60} / D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
d If soil contains ≥15% sand, add "with sand" to group name.
e Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
f. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
g. If fines are organic, add "with organic fines" to group name.
h. If soil contains ≥ 15% gravel, add "with gravel" to group name.
i. Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
j. If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
k. If soil contains 10 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant.
l. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
m. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
n. PI ≥ 4 and plots on or above "A" line.
o. PI < 4 or plots below "A" line.
p. PI plots on or above "A" line.
q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	OC	Organic content, %
WD	Wet density, pcf	S	Percent of saturation, %
MC	Natural moisture content, %	SG	Specific gravity
LL	Liquid limit, %	C	Cohesion, psf
PL	Plastic limit, %	∅	Angle of internal friction
PI	Plasticity index, %	qu	Unconfined compressive strength, psf
P200	% passing 200 sieve	qp	Pocket penetrometer strength, tsf

Particle Size Identification

Boulders	over 12"
Cobbles	3" to 12"
Gravel	
Coarse	3/4" to 3"
Fine	No. 4 to 3/4"
Sand	
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Silt	< No. 200, PI < 4 or below "A" line
Clay	< No. 200, PI ≥ 4 and on or above "A" line

Relative Density of Cohesionless Soils

Very loose	0 to 4 BPF
Loose	5 to 10 BPF
Medium dense	11 to 30 BPF
Dense	31 to 50 BPF
Very dense	over 50 BPF

Consistency of Cohesive Soils

Very soft	0 to 1 BPF
Soft	2 to 3 BPF
Rather soft	4 to 5 BPF
Medium	6 to 8 BPF
Rather stiff	9 to 12 BPF
Stiff	13 to 16 BPF
Very stiff	17 to 30 BPF
Hard	over 30 BPF

Drilling Notes

Standard penetration test borings were advanced by 3 1/4" or 6 1/4" ID hollow-stem augers unless noted otherwise, Jetting water was used to clean out auger prior to sampling only where indicated on logs. Standard penetration test borings are designated by the prefix "ST" (Split Tube). All samples were taken with the standard 2" OD split-tube sampler, except where noted.

Power auger borings were advanced by 4" or 6" diameter continuous-flight, solid-stem augers. Soil classifications and strata depths were inferred from disturbed samples augered to the surface and are, therefore, somewhat approximate. Power auger borings are designated by the prefix "B."

Hand auger borings were advanced manually with a 1 1/2" or 3 1/4" diameter auger and were limited to the depth from which the auger could be manually withdrawn. Hand auger borings are indicated by the prefix "H."

BPF: Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6" into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6" increments and added to get BPF. Where they differed significantly, they are reported in the following form: 2/12 for the second and third 6" increments, respectively.

WH: WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WR: WR indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

TW indicates thin-walled (undisturbed) tube sample.

Note: All tests were run in general accordance with applicable ASTM standards.

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LOG OF BORING

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-1**

LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **3/2/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1073.3	0.0					
1071.7	1.6	TS	LEAN CLAY, black, frozen. (Topsoil)			Elevations at the borings were provided by the City of Hutchinson.
1069.3	4.0	SC-SM	SILTY, CLAYEY SAND, gray, frozen, stiff. (Alluvium)	13		
		CL-ML	SILTY CLAY, brown, moist, very stiff. (Alluvium)	17		P200=64
				16		
1062.3	11.0			19		
		SC	CLAYEY SAND, with a trace of Gravel, brown, moist, very stiff. (Glacial Till)	26		
1057.3	16.0			18		
			END OF BORING. Water not observed while drilling. Water not observed with 14 1/2 feet of hollow-stem auger in the ground. Boring immediately backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 00696.GPJ BRAUN_08.GDT 3/10/09 15:58

BRAUNSM
INTERTEC

LOG OF BORING

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-2**
LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **3/2/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1079.8	0.0	TS	LEAN CLAY, black, frozen. (Topsoil)			
1078.5	1.3	SC	CLAYEY SAND, with a trace of Gravel, brown, frozen to moist, stiff to very stiff. (Glacial Till)	14		P200=46
				13		
				13		
				15		
				18		
1065.8	14.0	CL	SANDY LEAN CLAY, with a trace of Gravel, gray, moist, very stiff. (Glacial Till)	16		
1063.8	16.0		END OF BORING.			
			Water not observed while drilling.			
			Water not observed with 14 1/2 feet of hollow-stem auger in the ground.			
			Boring then backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 00696.GPJ BRAUN_08.GDT 3/10/09 15:45

BRAUN℠
INTERTEC

LOG OF BORING

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-3**
LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **3/2/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1074.1	0.0	TS	LEAN CLAY, black, frozen. (Topsoil)			
1073.0	1.1	SC	CLAYEY SAND, with a trace of Gravel, brown, frozen to moist, rather stiff to stiff. (Glacial Till)	12		
				9		
				11		
				10		
				10		
				13		
1058.1	16.0		END OF BORING.			
			Water not observed while drilling.			
			Water not observed with 14 1/2 feet of hollow-stem auger in the ground.			
			Boring immediately backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 00696.GPJ BRAUN_08.GDT 3/10/09 15:45

BRAUN[SM] INTERTEC

LOG OF BORING

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-4**

LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **3/2/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1070.4	0.0	TS	LEAN CLAY, black, frozen. (Topsoil)			
1069.1	1.3	SM	SILTY SAND, fine-grained, with a trace of Gravel, brown, frozen to moist, medium dense to dense. (Alluvium)	22		P200=37
				35		
				36		
1061.4	9.0	SC	CLAYEY SAND, with a trace of Gravel, brown, moist, very stiff. (Glacial Till)	24		
				26		
1056.4	14.0	CL	SANDY LEAN CLAY, with a trace of Gravel, gray, moist, very stiff to rather stiff. (Glacial Till)	15		
				12		
1044.4	26.0			13		
			END OF BORING. Water not observed while drilling. Water not observed with 24 1/2 feet of hollow-stem auger in the ground. Boring immediately backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

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INTERTEC

LOG OF BORING

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-5**

LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **2/27/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1063.0	0.0	TS	LEAN CLAY, black, frozen. (Topsoil)			
1061.6	1.4	SM	SILTY SAND, fine-grained, with a trace of Gravel, brown and gray, frozen to moist, medium dense to dense. (Alluvium)	17		
				42		
				29		
1054.0	9.0	SC	CLAYEY SAND, with a trace of Gravel, brown, moist, very stiff. (Glacial Till)	27		
1051.0	12.0	CL	SANDY LEAN CLAY, with a trace of Gravel, gray, moist, rather stiff to medium. (Glacial Till)	9		
				7		
				9		
1037.0	26.0			9		
			END OF BORING. Water not observed while drilling. Water not observed with 24 1/2 feet of hollow-stem auger in the ground. Boring immediately backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

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LOG OF BORING

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-6**
LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **2/27/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1060.2	0.0	TS	LEAN CLAY, black, frozen. (Topsoil)			
1059.2	1.0	CL-ML	SILTY, CLAY, brown, moist, stiff to very stiff. (Glacial Till)	14		P200=67
				17		
				20		
1051.2	9.0	CL	SANDY LEAN CLAY, with a trace of Gravel, gray, moist, rather stiff. (Glacial Till)	10		
				10		
				10		
				10		
				9		
1034.2	26.0		END OF BORING. Water not observed while drilling. Boring immediately backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 00696.GPJ BRAUN_08.GDT 3/10/09 15:58

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LOG OF BORING

Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-7**

LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **2/27/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1062.5	0.0					
1061.5	1.0	TS	LEAN CLAY, black, frozen. (Topsoil)			
		SC-SM	SILTY, CLAYEY SAND, with a trace of Gravel, brown and gray, frozen to moist, stiff. (Glacial Till)	25*		*Frozen
				16		
1055.5	7.0	SC	CLAYEY SAND, with a trace of Gravel, brown, moist, very stiff. (Glacial Till)	21		
1053.5	9.0	CL	SANDY LEAN CLAY, with a trace of Gravel, gray, moist, rather stiff. (Glacial Till)	12		
				11		
1046.5	16.0		-layer of waterbearing Sand at 15 feet.	13	▽	An open triangle in the water level (WL) column indicates the depth at which groundwater was first observed while drilling.
			END OF BORING.			

Water observed at 15 1/2 feet while drilling.

Water not observed with 14 1/2 feet of hollow-stem auger in the ground.

Water not observed to cave-in depth of 3 feet immediately after withdrawal of auger.

Boring immediately backfilled.

(See Descriptive Terminology sheet for explanation of abbreviations)

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Braun Project SC-09-00696
Geotechnical Evaluation
Proposed Industrial Park
Industrial Boulevard
Hutchinson, Minnesota

BORING: **B-8**
LOCATION: See sketch.

DRILLER: M. Nolden | METHOD: 3 1/4" HSA, Autohammer | DATE: **2/27/09** | SCALE: **1" = 4'**

Elev. feet	Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
1059.8	0.0	TS	LEAN CLAY, black, frozen. (Topsoil)			
1058.4	1.4	SC-SM	SILTY, CLAYEY SAND, gray, frozen. (Glacial Till)	20*		*Frozen
1055.8	4.0	SC-SM	SILTY, CLAYEY SAND, brown, moist, rather stiff to stiff. (Glacial Till)	11		
				16		
				9		
1047.8	12.0	CL	SANDY LEAN CLAY, with a trace of Gravel, gray, moist, medium. (Glacial Till)	7		
				8		
				8		
1033.8	26.0			7		
			END OF BORING. Water not observed while drilling. Boring immediately backfilled.			

(See Descriptive Terminology sheet for explanation of abbreviations)

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